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SPECIFICATION FOR MAGNETIC TAPES FOR SOUND RECORDING AND REPRODUCTION

PART 2 PROFESSIONAL GRADE (REEL-TO-REEL)

(First Revision)

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Indian Standard

SPECIFICATION FOR MAGNETIC TAPES FOR SOUND RECORDING AND REPRODUCTION

PART 2 PROFESSIONAL GRADE (REEL-TO-REEL)

(*First Revision*)

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Indian Standard

SPECIFICATION FOR MAGNETIC TAPES FOR SOUND RECORDING AND REPRODUCTION

PART 2 PROFESSIONAL GRADE (REEL-TO-REEL)

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 2) (First revision) was adopted by the Bureau of Indian Standards on 22 May 1987, after the draft finalized by the Recording Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 This standard covers the performance requirements for professional grade (reel-to-reel) magnetic tapes for sound recording and reproduction.

0.3 This standard was originally published in 1974. This revision includes the latest requirements of magnetic tapes in view of the indigenous technological developments.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard (Part 2) covers the general, physical, mechanical and electrical performance requirements for non-perforated professional grade (reel-to-reel) magnetic tapes for professional sound recording and reproduction.

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*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the terms and definitions given in IS : 1885 (Part 48/Sec 1)-1978* shall apply.

3. METHODS OF MEASUREMENTS

3.1 The performance requirements specified in this standard shall be measured by the test methods specified in IS : 4479-1981†.

4. GENERAL REQUIREMENTS

4.0 The provisions of IS : 4377-1981‡ shall apply with the following modifications.

4.1 Design — The tape along with the spool shall be capable of operation and storage at an ambient temperature ranging from −25°C to +55°C and relative humidity up to 95 percent.

4.2 Flammability — The tape shall be such that it passes as slow burning when tested in accordance with **7** of IS : 5431-1979§.

4.3 Base — The tape material to serve as a base of magnetic medium should generally consist of suitable pliable material, such as polyester.

4.4 The tape shall be calendered and polished to give a highly smooth, durable and scratch resistant surface.

4.5 The tape shall be provided with a 2 µm back coating providing a high conductivity matt-surface for elimination of electrostatic pick-up and provide better mechanical handling during play/rewinding.

5. PHYSICAL AND MECHANICAL REQUIREMENTS

5.1 The physical and mechanical requirements of the magnetic tape shall be as specified in Table 1.

6. ELECTRICAL REQUIREMENTS

6.1 The electrical requirements of the magnetic tape shall be as specified in Table 2.

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*Electrotechnical vocabulary : Part 48 Recording, Sec 1 Tape recording [*Superseding* IS : 1885 (Part 3/Sec 3)-1967]

†Methods of measurements on magnetic tapes for sound recording and reproduction (*first revision*).

‡Geneal requirements for magnetic sound tape recording and reproducing systems (*first revision*).

§Flammability requirements for motion-picture safety films (*first revision*).

TABLE 1 PHYSICAL AND MECHANICAL REQUIREMENTS OF MAGNETIC TAPE

(*Clause* 5.1)

SL No.	CHARACTERISTIC	REF TO METHODS OF MEASUREMENT OF IS : 4479-1981*	REQUIREMENTS
(1)	(2)	(3)	(4)
i)	Dimensions :		
	a) Width	4.2	$6.30^{+0}_{-0.06}$
	b) Total thickness	4.3	0·055 mm, *Max* 0·046 mm, *Min*
	c) Coating thickness	4.3	0·019 mm, *Max* 0·010 mm, *Min*
ii)	Length of the tape in each spool, *Min*		366 meter
iii)	Tensile strength :		
	a) Steady tensile strength	4.8.1	35 N
	b) Shock tensile strength	4.8.2	There shall be no breakages
iv)	Elastic elongation	4.9	
	a) Just prior to the removal of the load		0·6 percent
	b) At the end of 180 minutes after the removal of the load		0·3 percent
v)	Cupping (humidity stability)	4.5	No cupping in excess of 30°
vi)	Layer-to-layer adhesion	4.7	No sticking or layer-to-layer adhesion
vii)	Anchorage	4.6	The magnetic coating of tape shall show no evidence of anchorage failure.

*Methods of measurement on magnetic tapes for sound recording and reproduction (*first revision*).

TABLE 2 ELECTRICAL REQUIREMENTS OF MAGNETIG TAPE

(*Clause* 6.1)

Sl No.	Characteristic	Ref to Method of Measurement of IS : 4479-1981*	Requirements
(1)	(2)	(3)	(4)
i)	Maximum output level at 3% distortion at 1 KHz	5.1	+ 8 dB
ii)	Total harmonic distortion	5.3	Not to exceed 0·5 percent
iii)	Erasibility	5.4	The erasing field required to erase the tape to 60 dB below recorded level should not exceed $\frac{10^{+6}}{4\pi}$ AT/m†
iv)	Print through	5·8	The print through resulting from layer-to-layer signal transfer shall be better than 57 dB
v)	Frequency response	5.7	The frequency response of the tape shall be flat within ± 1·0 dB between 50 Hz to 14 KHz
vi)	Signal to-dc noise ratio	5.9	The ratio shall be better than 50 dB
vii)	Tape sensitivity	5.5	The Instantaneous variation in sensitivity measured as variation in reproduced level of a tone recorded on tape at a reference recording level shall not exceed the following values. Within the length of reel : at 1 kHz ± 0·5 dB at 10 kHz ± 1·0 dB From reel to reel $\left.\begin{array}{l}\text{at 1 kHz}\\ \text{at 19 kHz}\end{array}\right\} \pm 1\cdot0$ dB

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*Methods of measurement on magnetic tapes for sound recording and reprouction (*first revision*).

†1 AT/m = $4\pi \times 10^{-3}$ oerstead

7. MARKING

7.1 Each tape reel or its carton shall be marked with the following:

a) Name or trake-mark of the manufacturer,

b) Grade of tape (may be in code),

c) Tape length and spool size, and

d) Date of manufacture (may be in code).

7.2 The magnetic tapes may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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